iventor: MINO et al. locket No.: 10873.876US01 itle: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND JEVICE USING THE SAME ttorney Name. Douglas P. Mueller hone No.: 612.371.5237 heet 1 of 34

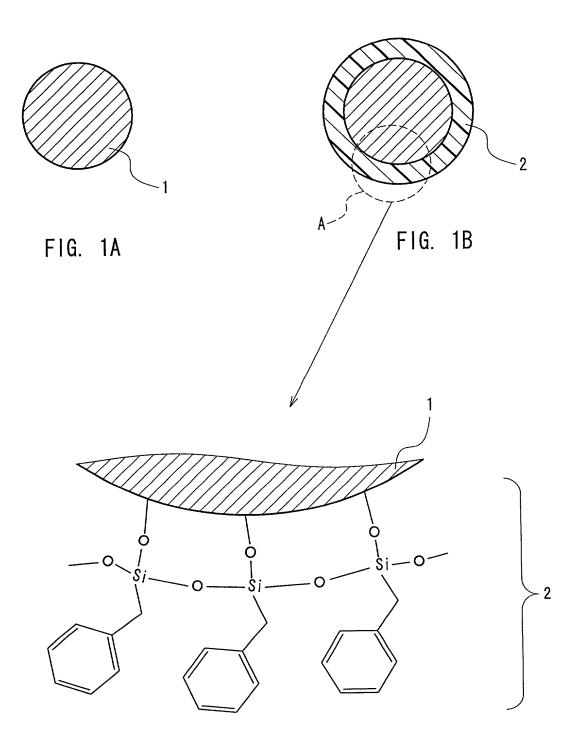
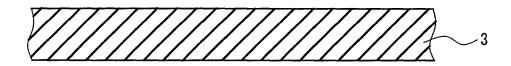
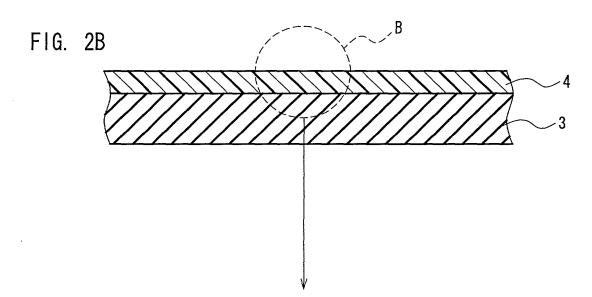


FIG. 10

nventor: MINO et al.
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ltle: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
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lttorney Name: Douglas P. Mueller
lhone No.: 612.371.5237
lheet 2 of 34

FIG. 2A





Iventor: MINO et al.
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hone No.: 612.371.5237
heet 3 of 34

FIG. 3A

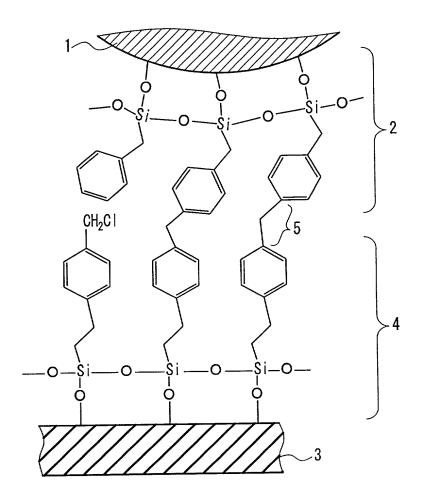
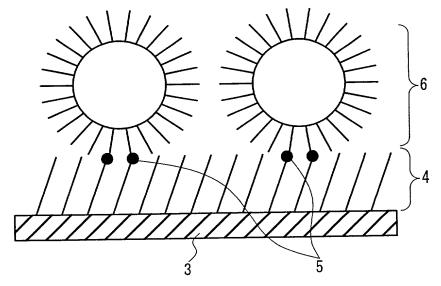


FIG. 3B



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Sheet 4 of 34

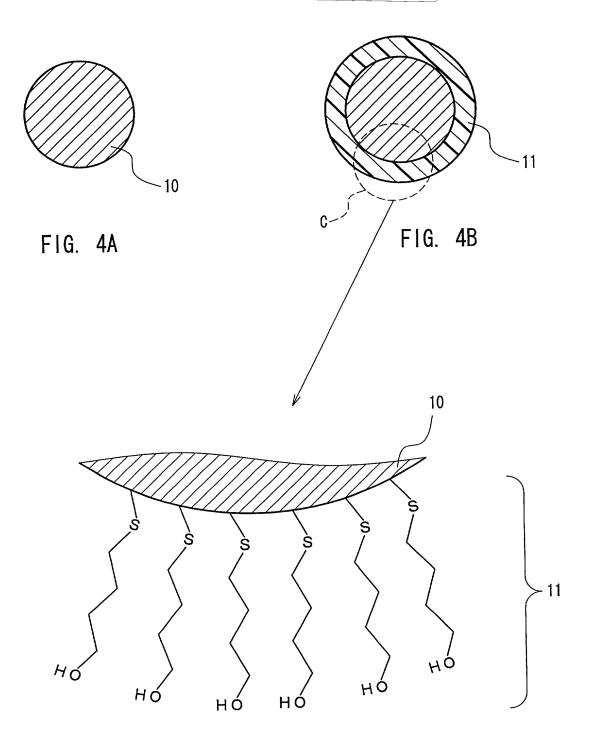
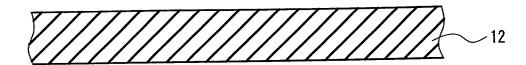


FIG. 4C

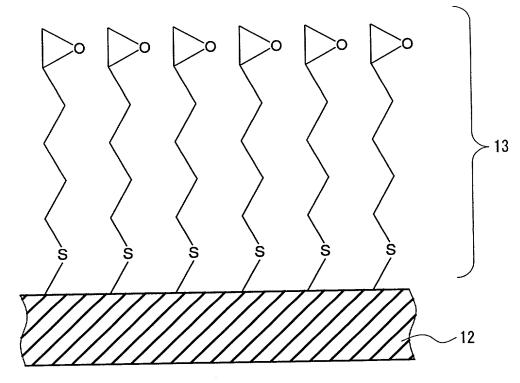
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heet 5 of 34

FIG. 5A



, D FIG. 5B -12

FIG. 5C



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Jocket No · 10873.876US01
(itie: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
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Attorney Name: Douglas P. Mueller
hone No.: 612.371.5237
Sheet 6 of 34

FIG. 6A

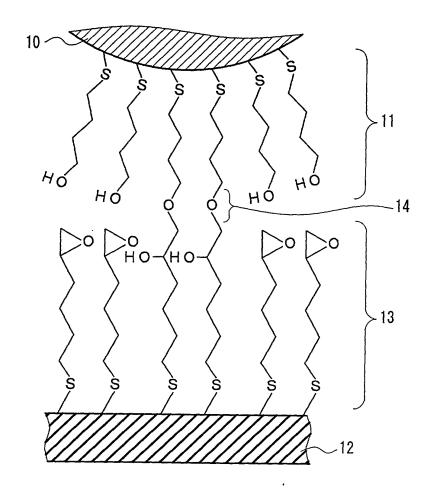
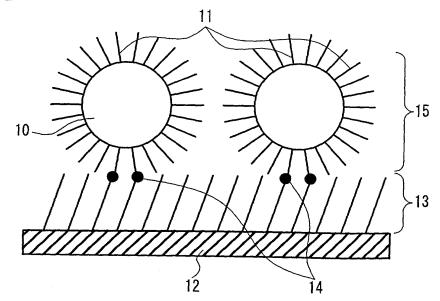


FIG. 6B



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heet 7 of 34

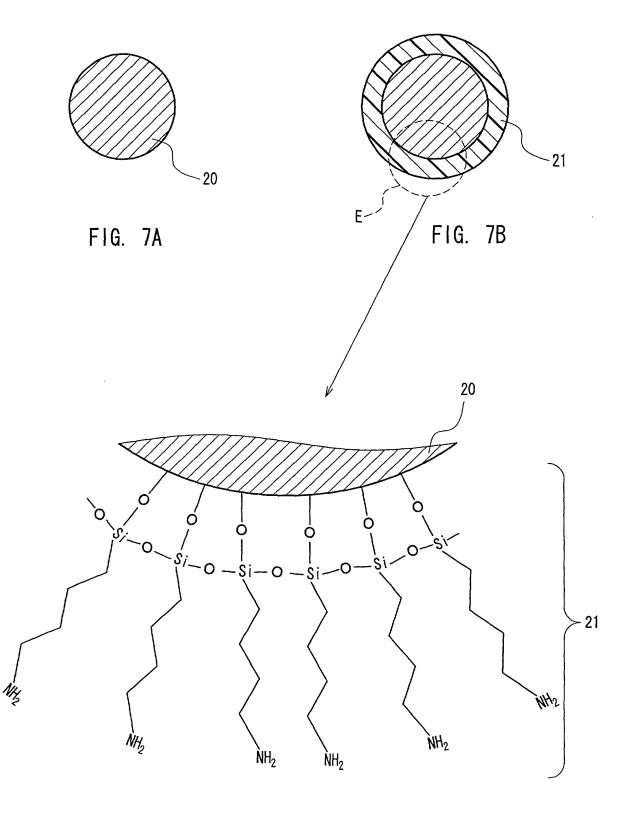
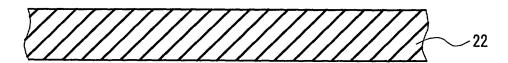


FIG. 7C

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Docket No.: 10873.876US01
Fitle: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No: 612.371.5237
Sheet 8 of 34

FIG. 8A



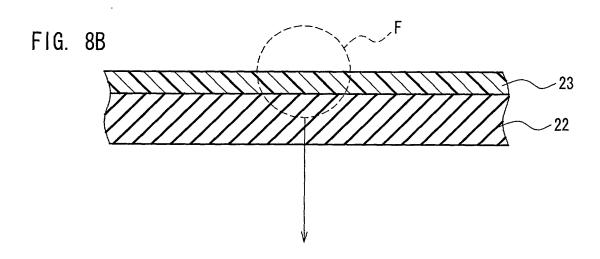
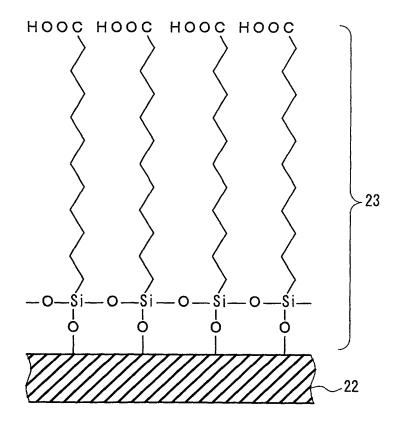


FIG. 8C



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FIG. 9A

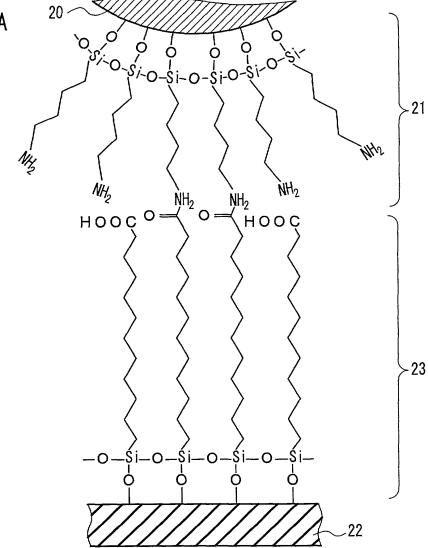
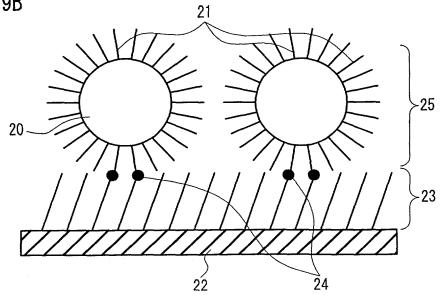


FIG. 9B



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Docket No.: 10873.876US01
Fitle. ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
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Attorney Name: Douglas P. Mueller
Phone No. 612 371.5237
Sheet 10 of 34

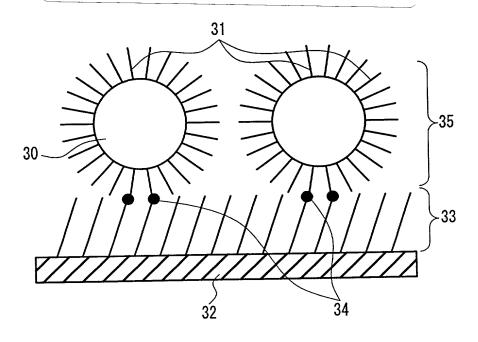


FIG. 10A

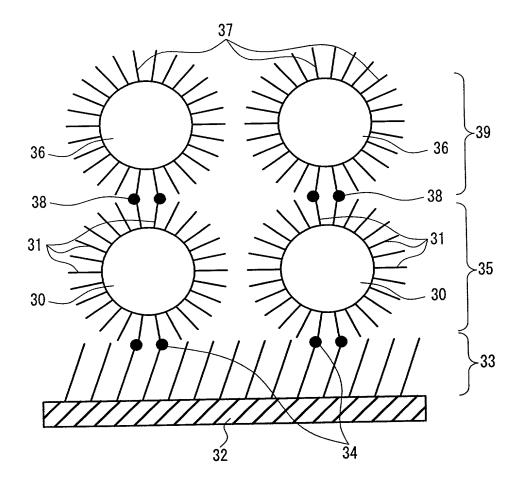


FIG. 10B

nventor: MINO et al.
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ltle. ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
DEVICE USING THE SAME
lttomey Name: Douglas P. Mueller
thone No.. 612.371.5237
theet 11 of 34

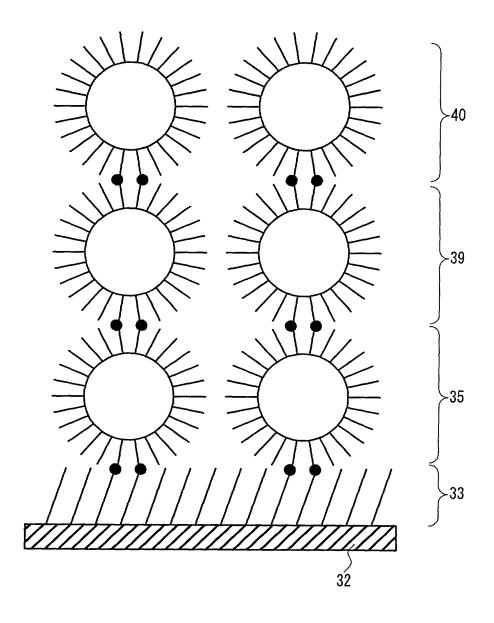


FIG. 11

nventor: MINO et al.
Docket No.: 10873.876US01
Fitle: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name. Douglas P. Mueller
Phone No.. 612 371.5237
Sheet 12 of 34

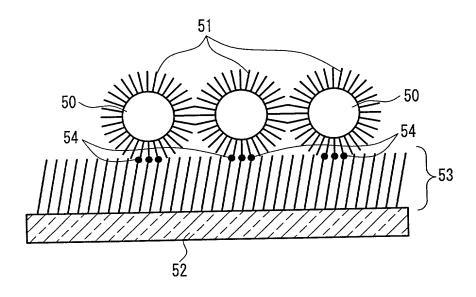
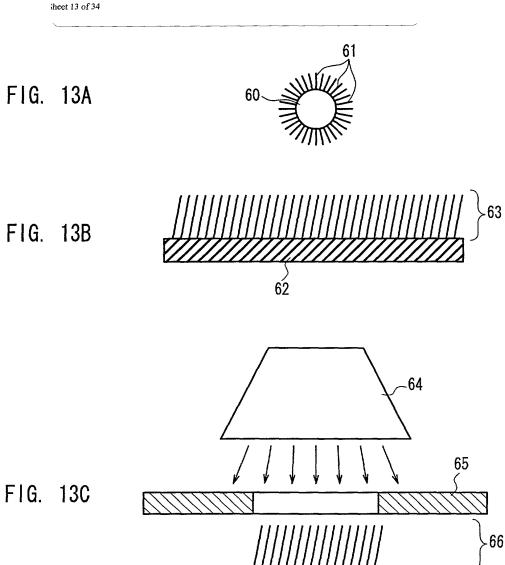
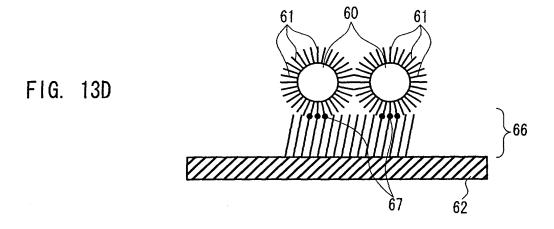


FIG. 12





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Docket No.: 10873.876US01
Fitle: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No.: 612 371.5237
Sheet 14 of 34

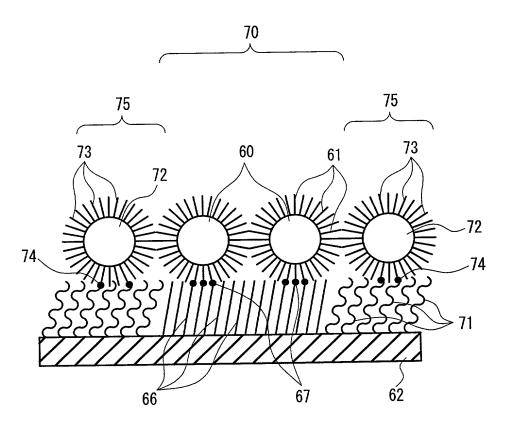


FIG. 14

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Jocket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
DEVICE USING THE SAME
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Theet 15 of 34

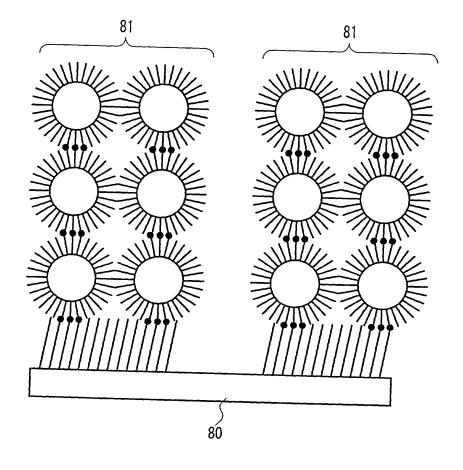


FIG. 15

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Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P Mueller
Phone No. 612.371.5237
Sheet 16 of 34

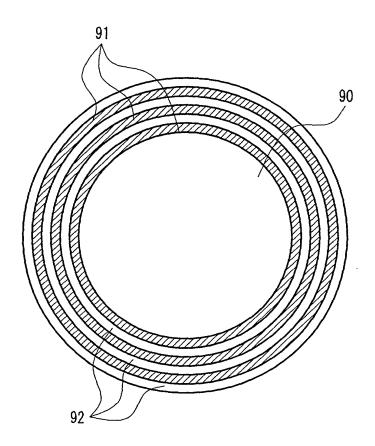


FIG. 16

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Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
DEVICE USING THE SAME
Attorney Name. Douglas P. Mueller
Phone No.: 612.371.5237
Sheet 17 of 34

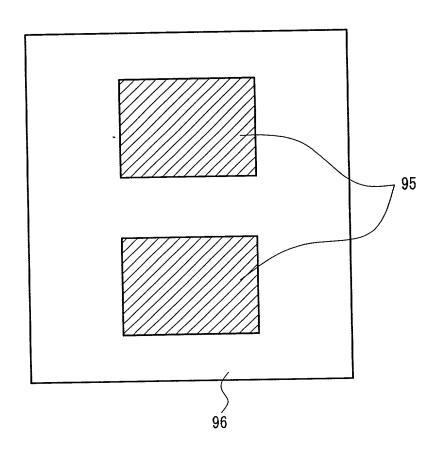


FIG. 17

(inventor: MINO et al.
Docket No.: 10873.876US01
Fitle: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P Mueller
Phone No · 612.371.5237
Sheet 18 of 34

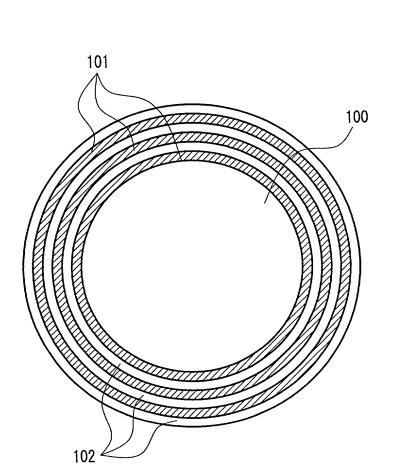


FIG. 18

nventor: MINO et al.

Docket No.: 10873 876US01

[title. ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND

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Attorney Name: Douglas P. Mueller

Phone No.: 612.371.5237

Sheet 19 of 34

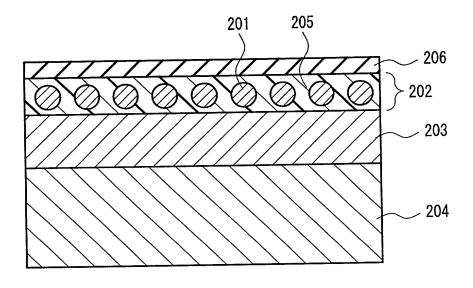


FIG. 19A

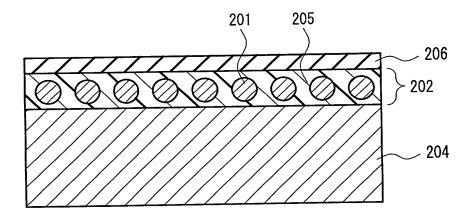


FIG. 19B

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No: 612.371 5237
Sheet 20 of 34

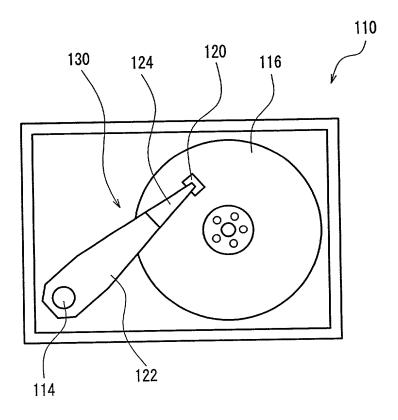


FIG. 20A

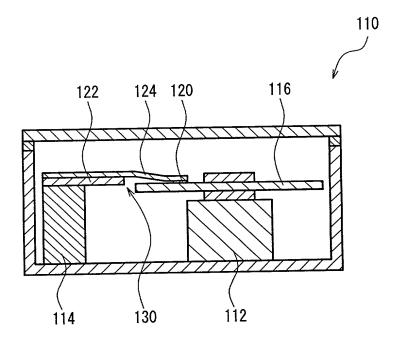


FIG. 20B

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No.: 612.371.5237
Sheet 21 of 34

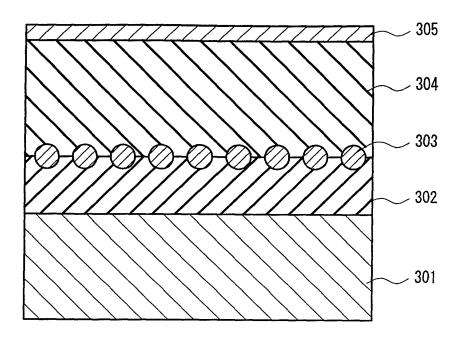


FIG. 21

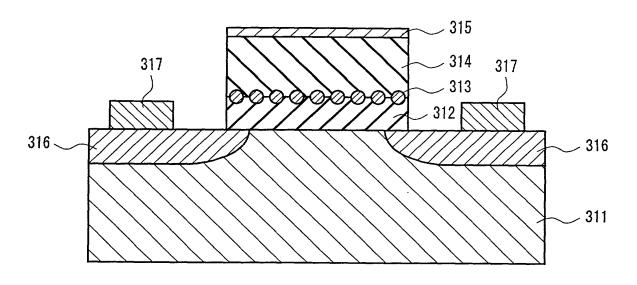
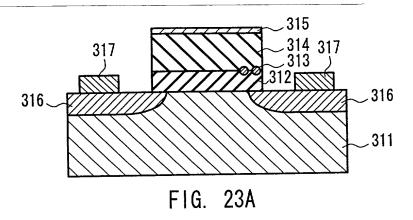
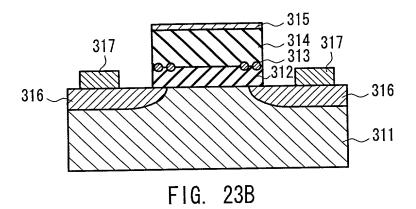
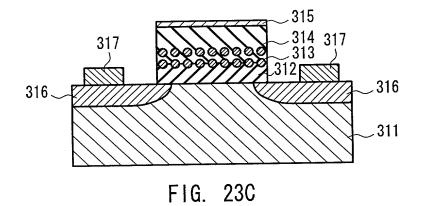


FIG. 22

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME AME
Attorney Name: Douglas P. Mueller
Phone No. 612.371.5237
Sheet 22 of 34







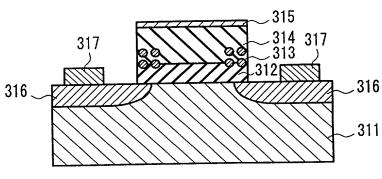


FIG. 23D

Inventor: MINO et al.
Docket No.: 10873.876US01
Title. ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P Mueller
Phone No.: 612.371 5237
Sheet 23 of 34

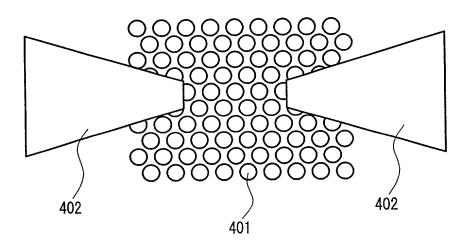


FIG. 24

Inventor: MINO et al.
Docket No.. 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME AMD Attorney Name: Douglas P. Mueller
Phone No.: 612.371 5237
Sheet 24 of 34

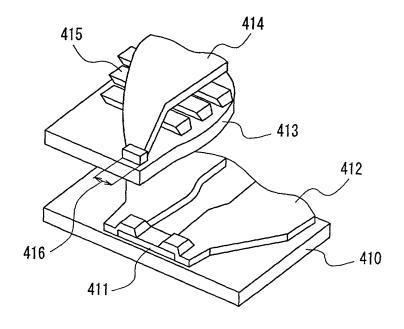


FIG. 25

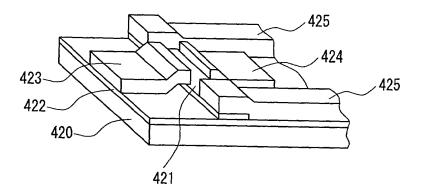


FIG. 26

Inventor: MINO et al. Docket No.: 10873.876US01

Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND

DEVICE USING THE SAME Attorney Name: Douglas P. Mueller

Phone No.: 612.371.5237

Sheet 25 of 34

amino group and - CICO group reaction system

$$R_1 - NH_2 + R_2 - COCI \rightarrow R_1 \stackrel{0}{\frown} R_2$$

hydroxyl group and - ROSi group reaction system

$$R_1 - OH + R_2 \longrightarrow SiR_3 \longrightarrow R_1 \longrightarrow SiR_3$$

benzyl group and - amino group reaction system

$$R_1$$
  $CH_2CI + H_2N$   $R_2 \rightarrow R_1$   $R_1$ 

benzyl group and - phenyl group reaction system

$$R_1$$
  $CH_2CI + R_2 \rightarrow R_1$   $R_2$ 

aldehyde group and - amino group reaction system

$$\begin{array}{c|c}
0 & H \\
C & H + R_2 - NH_2 \longrightarrow R_1 & R_2
\end{array}$$

phenyl group and alkyl group reaction system

$$R_1 \longrightarrow R_2 \longrightarrow R_1 \longrightarrow R_2$$

phenyl group and CICO group reaction system

$$R_1$$
 OH +  $R_2$  —  $COCI$   $\rightarrow$   $R_1$   $C$   $R_2$ 

benzyl group and - benzaldehyde group reaction system

$$R_1$$
  $\longrightarrow$   $CH_2CI + OHC$   $\longrightarrow$   $R_1$   $\longrightarrow$   $CHO$ 

isocyanate group and - amino group reaction system

isocyanate group and - hydroxyl group reaction system

epoxyl group and - amino group reaction system

$$R_1 \longrightarrow H_2N \longrightarrow R_2 \longrightarrow R_1 \longrightarrow NR_2$$

carboxyl group and - hydroxyl group reaction system

$$\begin{array}{c|c} 0 & & 0 \\ \parallel & \downarrow & 0 \\ R_1 & & C & \longrightarrow \\ 0 & & \downarrow & C & \longrightarrow \\ R_1 & & C & \searrow \\ R_2 & & & \end{array}$$

unsaturated binding group and - halogen group reaction system

$$R_1$$
  $R_2$   $R_1$   $R_2$ 

Inventor: M. O et al.
Docket No: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No.. 612.371.5237
Sheet 27 of 34

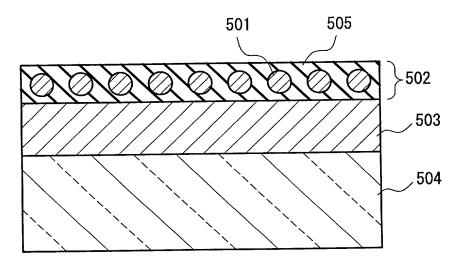


FIG. 29

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No.: 612.371.5237
Sheet 28 of 34

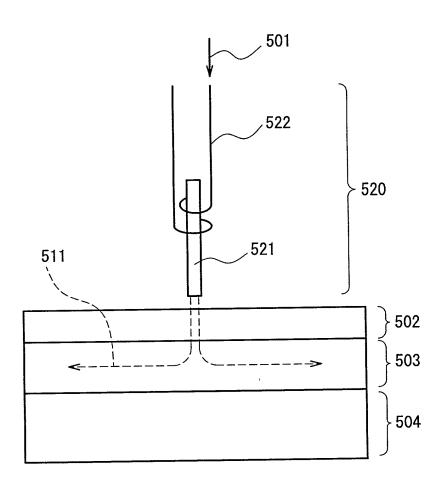


FIG. 30

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME

Attorney Name: Douglas P. Mueller Phone No.: 612.371.5237 Sheet 29 of 34

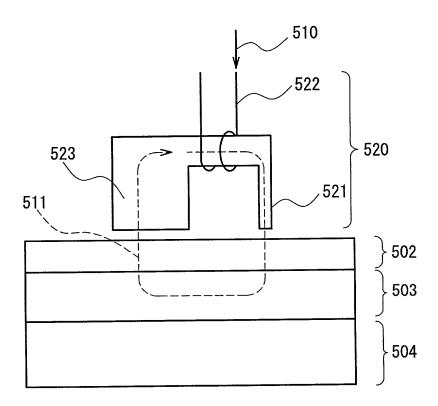


FIG. 31

Inventor: MINO et al.
Docket No: 10873.876US01
Title. ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME

Attorney Name: Douglas P. Mueller Phone No.: 612.371.5237 Sheet 30 of 34

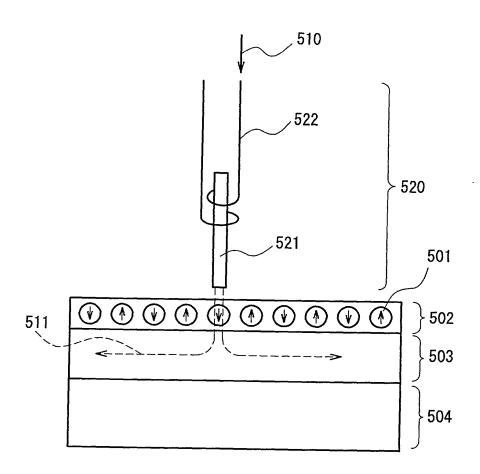


FIG. 32

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME

Attorney Name: Douglas P. Mueller Phone No.: 612.371.5237 Sheet 31 of 34

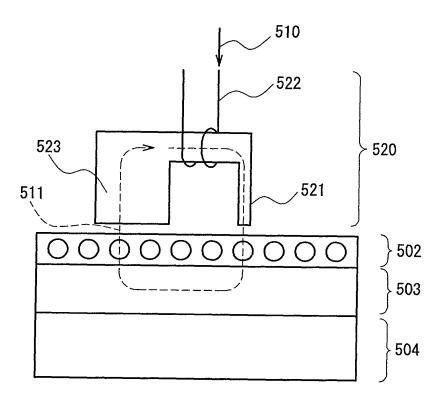
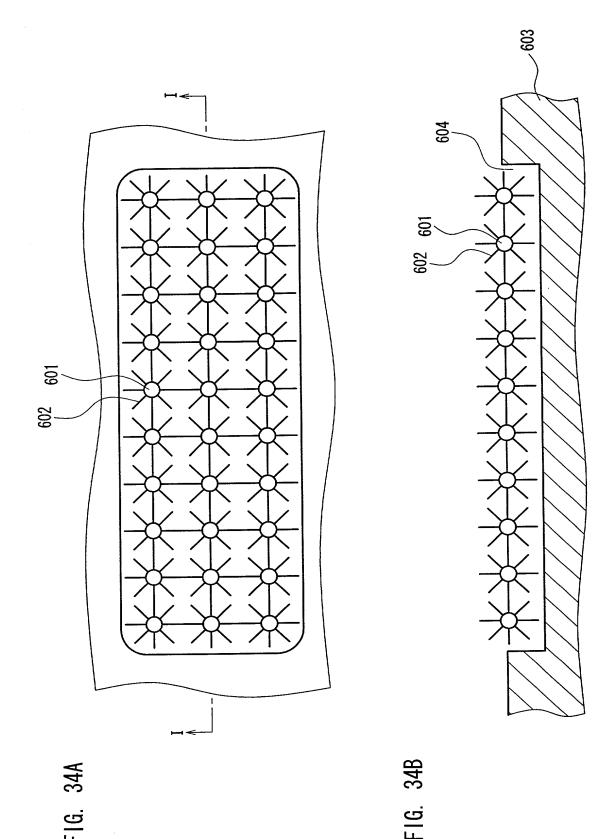


FIG. 33

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No.: 612.371.5237
Sheet 32 of 34



Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND
DEVICE USING THE SAME
Attorney Name: Douglas P. Mueller
Phone No.: 612.371.5237
Sheet 33 of 34

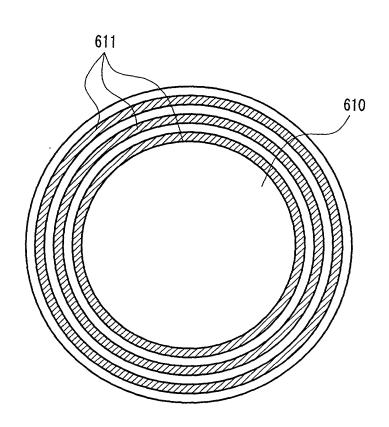


FIG. 35

Inventor: MINO et al.
Docket No.: 10873.876US01
Title: ALIGNED FINE PARTICLES, METHOD FOR PRODUCING THE SAME AND DEVICE USING THE SAME Attorney Name: Douglas P Mueller Phone No.: 612.371.5237 Sheet 34 of 34

FIG. 36A

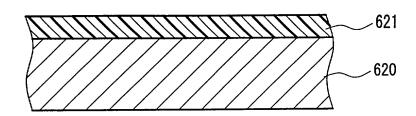


FIG. 36B

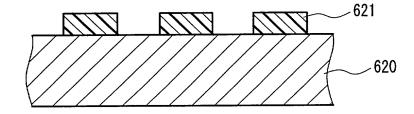


FIG. 360

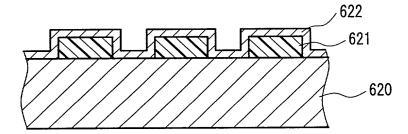


FIG. 36D

